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EXAMINER

NORTON, NADINE GEORGIANNA

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 07/16/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/744,978

Applicant(s)

ZANIBELLI ET AL.

Examiner

Nadine Norton

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) 36-48 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☒ Claim(s) 1-35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>5,6,8</u> | 6) <input type="checkbox"/> Other: |

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DETAILED ACTION***Election/Restrictions***

Applicants' election with traverse of Group I in Paper No. 11 is acknowledged. The traversal is on the ground(s) that there are no adequate reasons and/or examples provided to support the conclusion of patentable distinction between the groups in the restriction. This is not found persuasive because it is maintained that the different method of making limitations amount to different technical features. For instance, claim 1 (directed at a desulfurization process) employs a catalyst containing phosphorous along with its method of addition whereas claim 36 is directed at a catalyst containing FER prepared in the absence of phosphorous. The requirement is still deemed proper and is therefore made FINAL.

Specification

This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

Claim Objections

Claim 1-35 is objected to because of the following informalities:

Applicants' claims use the phrase "FER type". It appears that applicants are using the term "type" to refer to zeolites with FER structure. It is suggested that applicants to delete the term "type" in order to clarify that the zeolites are FER zeolites and not other zeolites that are similar to FER zeolites.

In claims 6-18 applicants use the phrase “varies from”. It is suggested that applicants use conventional terminology such as “ranging from”.

In claim 14, it appears as if applicants intend to include the term “, and” before the last term.

In claim 17, it appears as if applicants intend to change “is” to “are”.

In claim 28, it appears as if applicants intend to change the term “accordin” to “according”.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claims 1-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention.

In claim 1, it is unclear how the desulfurization process is accomplished since the claim does not contain any positive recitation of required steps. It appears as if applicants accomplish the claimed process by “contacting” the feed with the catalyst defined in applicants’ claims. If this is the case, it is suggested that applicants amend the claim accordingly.

In claim 1, the specific combination of possible catalyst production methods when component A is selected to be phosphorous is unclear. It is suggested that applicants clearly list the specific methods in a way that clarifies when one method ends and another begins. Applicants may want to use a format similar to “...wherein the catalyst is obtained by one of the following: method 1; method 2;etc.

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In claim 1, applicants use the phrase “with possible skeletal isomerization”. It is unclear if skeletal isomerization is required by the claim.

In claim 2, applicants use the phrase “mixtures of said zeolite of FER type in a quantity ranging from 5 to 30% by weight...”. It is unclear if the entire “mixture” is 5-30% by weight or whether the FER zeolite portion of the mixture is 5-30% by weight.

Claim Rejections - 35 USC §103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-28 and 31-33 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Degnan et al.(5,378,352).

Applicants are claiming a process for desulfurizing a hydrocarbon which boils in the range of 35-250°C. The claimed process involves contacting the feed with a catalyst comprising a Group VIII metal, a Group VI metal, a metal oxide carrier, and a Component A selected from a FER type zeolite, phosphorous, and mixtures thereof. Applicants' claims contain additional limitations defining how the catalyst is made, process conditions, and sulfur content of the feed.

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The reference of Degnan et al.(5,378,352) discloses a process of desulfurizing a full range naphtha boiling range product boiling in the range of C5 up to 420°F (215°C). See column 5, lines 41-50. The feed may contain 1000 ppm sulfur. See column 5, lines 16-25. The feed can be produced by cracking. See column 5, lines 51-55. The reference teaches process conditions including a temperature of at least 650°F (343°F), an LHV of 0.5 to 10, and a hydrogen amount of 100-20,000 SFB. See column 6, lines 10-21. The catalyst contains components including an acidic ZSM-35, a group VIII metal (cobalt or nickel), a group VI metal (tungsten or molybdenum, a metal oxide (alumina). See column 6, lines 10-60. The molar ratio of Group VIII to Group VI is no greater than 2, preferably greater than 1. See column 6, lines 31-34.

The reference of Degnan et al.(5,378,352) succeeds at disclosing a desulfurization process employing a catalyst with components and feed corresponding to those claimed by applicants. The disclosure of a naphtha feed encompasses applicants' olefin containing limitation because naphthas contain olefin components. The reference's disclosure of ZSM-35 meets applicants FER type limitation and Si/Al limitation. In addition, the disclosed acidic composition by definition contains cation sites occupied by hydrogen.

It is noted that the Degnan et al.(5,378,352) is silent about the specific amounts of each of the catalyst components and hydrogen ions, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select any amount or proportion that would accomplish an effective conversion, including the specific amounts claimed by applicants, because it has been held that there is no invention where the difference in proportions is not critical and was ascertained by routine experimentation since the determination of workable ranges is not considered to be inventive. In re Swain and Adams, 70 USPQ 412 (CCPA 1946).

It is noted that the reference of Degnan et al.(5,378,352) is silent about the method by which the disclosed catalyst is made. Applicants' catalyst method of making limitations are considered to be product by process claims. It has been held that patentability is based on the final composition and not the method by which it was made. In re Marosi, 218 USPQ (Fed. Cir. 1983) and In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985). Since the final catalyst composition disclosed by Degnan et al.(5,378,352) seems to be the same as that defined in applicants' claims, applicants' catalyst fails to distinguish over the applied reference.

Claim Rejections - 35 USC § 103

Claims 1-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over (EP 0 665 280).

The reference of (EP 0 665 280) discloses a process for hydrodesulfurizing a feed boiling in the range of 150-400°C containing up to 3% by weight sulfur. See page 6, lines 45-50. The reference teaches process conditions including a temperature of 320-360°C. See page 6, lines 50-54. (EP 0 665 280) teaches the use of a catalyst including a VIII metal (nickel or cobalt), a VI metal (molybdenum or tungsten), phosphorous, an inorganic oxide carrier (alumina), and a ZSM type carrier. See page 4, lines 20-25, 50-54, and page 5, lines 1-4. The final catalyst may contain 10-30% by weight VI metal in terms of the oxide, 3 to 7% by weight VIII metal in terms of the oxide, 80-99% by weight inorganic oxide, and 2 to 15% by weight phosphorous in terms of the oxide. See page 5, lines 23-40 and page 4, lines 35-40.

(EP 0 665 280) teaches that the disclosed catalyst can be prepared by incorporating the catalyst components into a carrier by employing "known" "conventional techniques" including



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impregnation employing water and or alcohol solvents. See page 5, lines 9-25. The impregnated carriers are dried and calcined. See page 6, lines 1-18.

The reference of (EP 0 665 280) succeeds at disclosing a desulfurization process employing a catalyst with component and components amounts overlapping those claimed by applicants. In addition, the reference succeeds at disclosing steps corresponding to applicants' water/alcohol impregnation, drying and calcining. The reference's disclosure of an "acidic" composition meets applicants' hydrogen cation occupancy limitation because acidic compositions contain hydrogen by definition.

Several differences are noted between the reference of (EP 0 665 280) and applicants' claimed invention. Although the reference broadly discloses the use of a ZSM type zeolite, it is silent about a specific FER in the form of ZSM-35. In addition, the reference is silent about the amount of hydrogen ions occupying the cation sites.

The reference of Degnan et al.(5,378,352)is cited to illustrate that an FER in the form of ZSM-35 is suitable for sulfur removal. See column 6, lines 35-38.

Since the reference of (EP 0665 280) does not limit the specific ZSM-type catalyst employed in the desulfurization process, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ an FER type zeolite in the form of ZSM-35 because the reference of Degnan et al.(5,378,352) illustrates that ZSM-35 is effective for accomplishing desulfurization.

While the reference suggests applicants' aqueous and alcohol solutions, drying, and calcining are conventional, it is noted that the reference does not disclose "all" of applicants' catalyst method of making limitations (e.g. temperature, specific impregnating salts, etc.).

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Applicants' catalyst method of making limitations are considered to be product by process limitations. It has been held that patentability is based on the final composition and not the method by which it was made. In re Marosi, 218 USPQ (Fed. Cir. 1983) and In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985). As a result, applicants' additional catalyst method of making limitations do not distinguish applicants' catalyst over the catalyst employed in the applied art.

Claim Rejections - 35 USC § 103

Claims 1-28 and 31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al.(5,482,617).

The reference of Collins et al.(5,482,617) discloses a processes for desulfurizing a hydrocarbon boiling in the range of 70-450°F (21-232°C) which contains olefins. See column 3, lines 1-30. The feed contains more than 200 ppm sulfur. See column 3, lines 50-53. The reference teaches the use of a catalytic composition including ZSM-35, a metal oxide in the form of alumina,, a group VIII metal in the form of nickel or cobalt, and a group VI metal in the form of molybdenum or cobalt. See column 5, lines 30-42. The zeolite is employed in its acid form. See column 5, lines 29-30.

The reference of Collins et al.(5,482,617) succeeds at disclosing a desulfurization process employing a feed and catalyst with components corresponding to those claimed by applicants. The reference's disclosure of ZSM-35 meets applicants FER type limitation and Si/Al limitation. The reference's disclosure of an acidic composition encompasses applicants' hydrogen occupancy limitations because acidic compositions contain hydrogen by definition (hydrogen = acidity).

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It is noted that the reference of Collins et al.(5,482,617) is silent about the specific component amounts employed. The reference does not disclose all of applicants' catalyst method of making limitations.

It is noted that the Collins et al.(5,482,617) is silent about the specific amounts of each of the catalyst components and hydrogen ions, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select any amount or proportion that would accomplish an effective conversion, including the specific amounts claimed by applicants because it has been held that there is no invention where the difference in proportions is not critical and was ascertained by routine experimentation because the determination of workable ranges is not considered to be inventive. In re Swain and Adams, 70 USPQ 412 (CCPA 1946).

It is noted that the reference of Collins et al.(5,482,617) is silent about the method by which the disclosed catalyst is made. Applicants' catalyst method of making limitations are considered to be product by process claims. It has been held that patentability is based on the final composition and not the method by which it was made. In re Marosi, 218 USPQ (Fed. Cir. 1983) and In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985). Since the final catalyst composition disclosed by Collins et al.(5,482,617) seems to be the same as that defined in applicants' claims, applicants' catalyst fails to distinguish over the applied reference.

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Prior Art of Record

The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. The attached references are cited to illustrate the relative state of the art with respect to desulfurizing with compositions containing components similar to those in applicants' catalyst.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nadine Norton whose telephone number is 703-305-2667. The examiner can normally be reached on Monday through Thursday from 8:30 am to 7:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 703-308-4311. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0661.

N.N.

July 10, 2003

**NADINE G. NORTON
PRIMARY EXAMINER**

